ABSTRACT OF THE DISCLOSURE

A method and mechanism for performing branch prediction. A processor is configured with a first level branch prediction cache which is configured to store branch prediction information corresponding to a group of instructions. In addition, a second level branch prediction cache is utilized to store branch prediction information which is evicted from the first level cache. The second level branch prediction cache is configured to store only a subset of the information which is evicted from the first level cache. Branch prediction information which is evicted from the first level cache and not stored in the second level cache is discarded. Upon a miss in the first level cache, a determination is made as to whether the second level cache contains branch prediction information corresponding to the miss. If corresponding branch prediction information is detected in the second level cache, the detected branch prediction information is fetched from the second level cache and is used to rebuild complete branch prediction information which may then be used in making a prediction.